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AMENDED CLAIMS

[received by the International Bureau on 29 November 2005 (29.11.2005); original claims 1-18 replaced by amended claims 1-23 (4 pages)]

Claim 1. A nano-imaging apparatus comprising multiple optical elements of sub-micron, nanometer scale (2) supported onto a partlyor fully radiation transmitting layer (3), which in turn is situated on top of a radiation sensitive layer (4) being patterned so that under each ofsaid optical elements there exists at least more than one radiation harvesting element that may be individually affected by radiation.

Claim 2. The nano-imaging apparatus according to Claim 1, wherein the material of the individual optical elements has a property that causes them to function as lenses.

Claim 3. The nano-imaging apparatus according to Claim 2, wherein the partly or fully radiation transmitting layer (2 or 3) comprises homogenous material or heterogeneous material, e.g. a layer consisting of fiber, spacer or a fluid or combinations thereof, being malleable by changing its volume, spacing, curvature, other shape change, or chemistry.

Claim 4. The nano-imaging apparatus according to Claim 3, wherein the functions of focusing, light filtering, optical correction or zooming are achievable by at least one of fluidic, capillary force, molecular rearrangement, chemistry, or nano-sized levers or fibers to adjust size or refractive property of the optical system.

Claim 5. The nano-imaging apparatus in accordance with Claim 4, wherein the optical elements further comprise different layers of refractive material enabling radiation of different wavelengths to be manipulated during the path through the optical element to compensate for aberration effects,

and wherein the material and malleability of the individual optical elements and system are capable of focusing, zooming, light filtering and optical aberration correction.

Claim 6. The nano-imaging apparatus according to Claim 2, wherein the radiation harvesting elements work as a photoelectric device that produces an electronic signal.

Claim 7. The nano-imaging apparatus according to Claims 6, wherein the electronic signal produced can be monitored and/or manipulated by electronic digital processing making an electronic read-out possible.

Claim 8. The nano-imaging apparatus according to Claim 7, wherein by image enhancing processing algorithms, overlapping information from physically (geometrically) or electronically defined arrays of sensors or "sectors" one can obtain a high resolution image.

Claim 9. The nano-imaging apparatus according to Claim 8, wherein since each of the lenses has a slightly different spatial viewpoint, the multiple information from electronically or geometrically defined multiple sectors of the array of sensors can be processed to obtain 3-D or stereotypic images.

Claim 10. The nano-imaging apparatus according to Claim 2, further comprising at least one shutter layer, wherein said apparatus is barely visible to ordinary vision or incorporated into either large, micro-sized or nano-sized devices.

Claim 11. The nano-imaging apparatus according to Claim 1, wherein all elements of the imaging apparatus are made out of flexible materials.

Claim 12. The nano-imaging apparatus in accordance with Claim 1, wherein the optical elements are arranged cylindrically as on a flexible tape, or spherically to obtain wide angle views.

Claim 13. The nano-imaging apparatus according to Claim 1, further comprising a wide angle view detector having a sensor array curved in a 2-dimensional fashion combined with stitching the information together to thereby produce up to 360 degree panoramic imaging.

Claim 14. The nano-imaging apparatus according to Claim 1, further comprising a wide angle view detector having a sensor array spherized in a 3-dimensional fashion combined with stitching the information together thereby producing a full 360 degree imaging capability in all 3-dimensions in "fisheye", circular, rectilinear, or other fat map projections.

Claim 15. The nano-imaging apparatus according to Claim 2, wherein color imaging and spectroscopic imaging are achieved by utilizing equal-sized lenses and using multi-wavelength sensing layers below the lenses.

Claim 16. The nano-imaging apparatus according to Claim 2, wherein spectroscopic imaging and/or spectroscopy can be achieved by taking advantage of the optical properties of nano-scaled lenses by controlling the diameter of the lenses at a nanometer level thereby accepting various wavelengths below the diffraction limit.

Claim 17. The nano-imaging apparatus according to Claim 16, wherein stepwise-sized lenses with gradually increasing/decreasing diameter are employed by utilizing processing to remove the cumulative component of the incrementally larger lenses.

Claim 18. The nano-imaging apparatus according to Claim 17, wherein the smallest diameter lens is capable of admitting only the UV-light waves and the largest diameter lens admitting all wavelengths up to IR-radiation.

Claim 19. The nano-imaging apparatus according to Claim 16, wherein color imaging can be achieved by controlling the diameter of a limited set of two or more lenses at a nanometer level.

Claim 20. The nano-imaging apparatus according to Claim 19, wherein lenses with different diameters are utilized to detect discrete wavelengths which subsequently are additively combined to produce a color-code necessary for standard (e.g. RGB, CMYK) or false color processing.

Claim 21. The nano-imaging apparatus according to Claim 7, wherein the electronic read-out signal is electronicallyprocessed in multiple ways, including by delivery to further imbedded processing and storage circuitry, or to deliver information to a separate or remote device, which in itself stores information for that can be observed, stored and /or redelivered/re-broadcast.

Claim 22. The nano-imaging apparatus according to Claim 1, wherein multiple of said apparatuses are distributed in space and in communication with each other and/or a central processor enabling retrieval of multiple information, wherein said information can be assembled interferometrically or to create multiple viewpoints seeing around obstacles.

Claim 23. The nano-imaging apparatus according to Claim 22, wherein said multiple of siad apparatuses are employable as a tracking device enabling full 3-dimensional capability as well as a "measurement station" making true 3-dimensional metric determination ofan unknown object.